Current Conditions Biota Sampling 2019

April 4, 2019

DQOs for Biota Tissue Program

- **Primary DQO – Evaluate trends**

  Collect initial data to establish current chemical (TCDD and PCBs) concentrations in fish and crab in the LPRSA upper 9-mile area (RM 8.3 to Dundee Dam) to monitor changes in post-interim action changes in tissue concentrations.

- **Secondary DQO – Refine/validate FWM**

  Evaluate FWM performance using the 2019 fish and crab tissue data and refine model as needed.

Current Conditions DQOs: Fish and crab tissue analysis

DQO	Study Questions	Data Evaluations
1 – Evaluate trends	• What are the current chemical (TCDD, PCBs) concentrations in fish and crab in the LPRSA (upper 9 miles)? • How do the current conditions determine potential for biota recovery via trend analysis?	• Establish concentrations for future trend analysis
2 – Refine and validate FWM	• Hoes does the FWM perform using the 2019 data? • Can the calibration of the model be improved?	• Evaluate model performance • Refine FWM

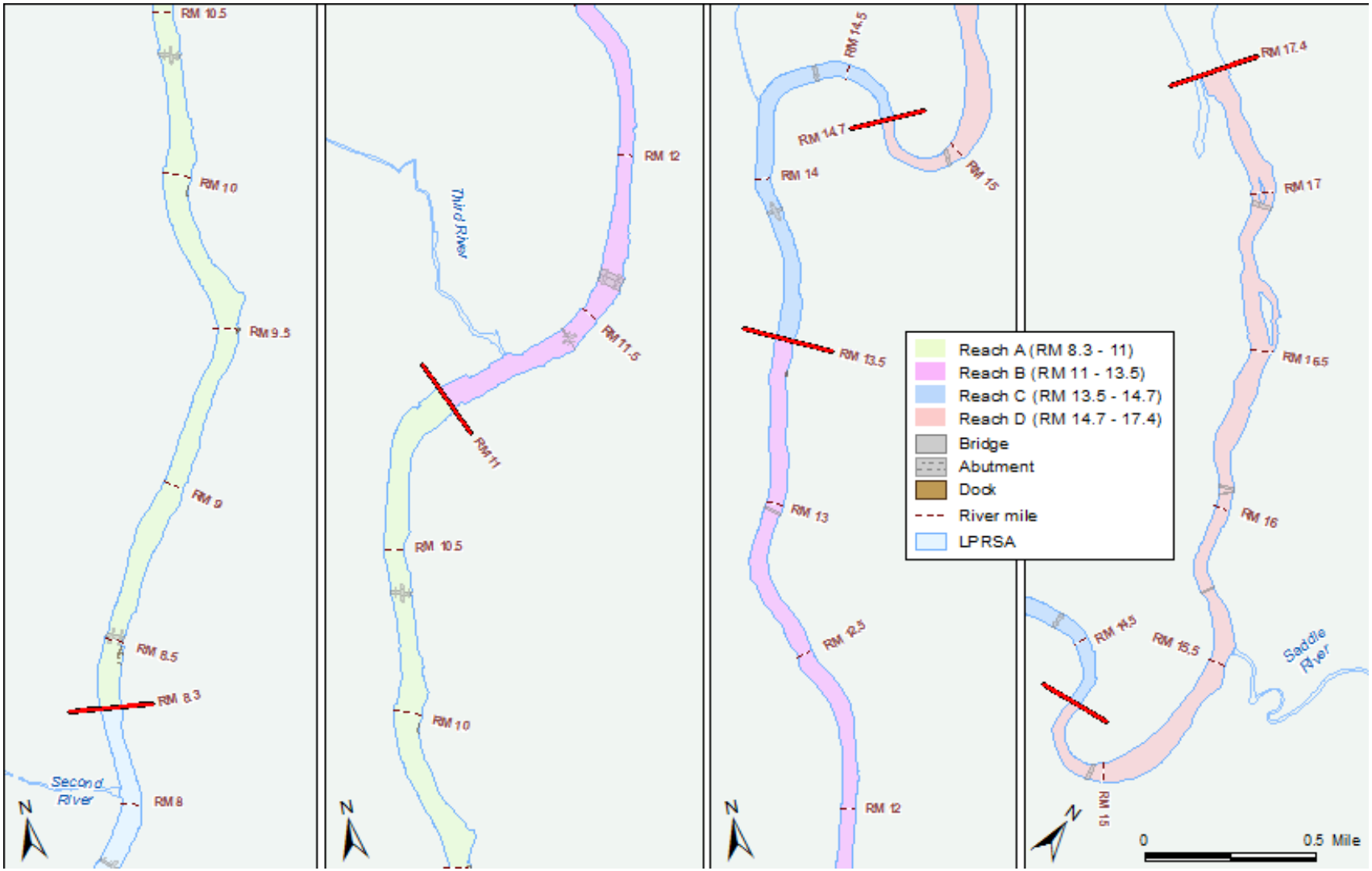
Overview of Approach

- Objective – understand area-wide average TCDD and total PCB concentrations in fish and crab for the upper 9 miles of the LPRSA (RM 8.3-Dam).
- Sampling areas –
  - Focus on four primary areas for sample design informed by 2009/2010 data and Food Web Model (FWM) areas
  - RM 8.3-11, RM 11-13.5, RM 13.5-14.7, and RM 14.7-Dam
- Collect samples during the same time of year as most samples in 2009/2010 (late summer/early fall).

Selection of Species for Sampling

Possible Species	Useful for FWM Validation?	LPRSA Abundance	Site Fidelity (short-term)	Salinity Tolerance	Proposed for Sampling?
Small forage fish (sunfish)	X	moderate/ high	high	no	Yes
American eel (<35 cm)	X	moderate (high near dam)	moderate; move out of LPRSA to spawn as adults	yes	No
American eel (>35 cm)	X	moderate	moderate; move out of LPRSA to spawn as adults	yes	Yes
Blue crab	X	high	low/moderate	yes	Yes
Carp	X	high	moderate; may also move into tributaries	no	Yes
White perch (adult)	X	moderate	low	yes	yes
Catfish	X	moderate	low	moderate	No
Bass	X	low	high	no	No

Sampling Areas



Evaluating Trends

- Methods:
  - Graphical evaluation
- Reducing variance
  - Target fish sizes
  - Species
  - Sampling areas

Proposed biota tissue sampling

- Proposed species for sampling:

Species	Proposed Tissue Type(s)	Target No. of Samples	Fish Per Composite	Most Effective Sampling Method (s)
American eel (35-60 cm)	Fillet, remainder (calc'd WB)	12 composites	3	trotline
Blue crab	muscle/hep, carcass (calc'd WB)	12 composites	3	crab trap, gillnet
Carp	Fillet, remainder (calc'd WB)	12 composites	3	gillnet, boat electrofishing
Small forage fish (sunfish)	Whole body	12 composites	5 to 10	electrofishing (boat/backpack), minnow trap, beach seine
Perch	Fillet, remainder (calc'd WB)	12 composites	3	gillnet, boat electrofishing

- Year 1 – target maximum of 60 composites (108 analytical samples)
- Methods – trotlines, boat electrofishing, crab traps, minnow traps, gillnets, and beach seine

Adaptive Sample Design

Use Year 1 data to determine the following:

- **Tissue types** –
  - Is the relationship between fillet (or muscle for blue crab) and whole body concentrations sufficient to allow for only the collection of fillet (or muscle) data during year 3 sampling?
- **Need for Year 2 Sampling and Number of samples** –
  - Evaluate the need for Year 2 sampling (i.e., conduct sampling if significant changes in conditions that would affect chemical exposure such as shift in water temperatures or sustained water flow that might affect prey availability.)
  - Are fewer samples acceptable for future monitoring work based on measured variances in tissue concentrations?

Biota tissue sampling task deadlines

Month	Task
April	• Determine details of sampling plan with EPA • Finalize boat/equipment contractor(s) • Finalize laboratories and analytical methods • Finalize field sampling dates • Initiate work on parts of QAPP Addendum
May	• QAPP Addendum Preparation and submittal to CPG • Establish subcontract agreements and POs (boat operators, laboratories, and validator)
June	• Apply for NJDEP scientific collection permit • EPA review of QAPP Addendum
July	• Locate and set-up field laboratory. • Conduct pre-sampling recon (site conditions and access)
August	• Mobilization of supplies and equipment prep to field facility • Finalize QAPP addendum
September	• Fieldwork begins (target starting field effort in mid-September)

QAPP Addendum Schedule

- Draft schedule for QAPP Addendum:

	QAPP Addendum	Review Duration
To CPG	May 17	2 weeks
To EPA	June 15	3 weeks
Revised to EPA (draft final)	July 15	1 week
Comments from EPA	August 1	1 week
Final QAPP to EPA	August 21	--

- Assumes meetings with EPA prior to May 1 to finalize key details (e.g., species, number of samples, laboratories/methods, etc.)

Analytical Laboratories

Analysis/ Sample Prep	Previous Lab	Proposed Lab
Tissue processing and compositing	Alpha Analytical	Alpha Analytical
PCBs	SGS - Analytical Perspectives	Cape Fear Analytical
Dioxins/furans	SGS - Analytical Perspectives	Cape Fear Analytical
Lipids	CAS	TBD – Method dependent
Percent Moisture	Alpha Analytical	Cape Fear or Alpha Analytical

Notes:

- Is Bligh-Dyer lipid method required?
- Staffing changes at SGS-AP
- Validator = LDC
- Data management = ddms